

What is claimed is:

1. A method for manufacturing a bevel gear member, said method comprising the steps of:

- 5 a) providing a bevel gear blank having a gearhead;
- b) forming gear teeth on said gearhead of said bevel gear blank by simultaneously cutting gear tooth top land, gear tooth side profile and a bottom land to form an unfinished bevel gear member; and
- c) machining at least one selected surface of said unfinished bevel gear member using
- 10 said top lands of said gear teeth as a datum for centering said unfinished bevel gear member.

2. The method for manufacturing the bevel gear member as defined in claim 1, wherein said bevel gear blank is a single-piece, unitary workpiece.

15 3. The method for manufacturing the bevel gear member as defined in claim 2, wherein said unitary workpiece is formed by one of a forging and casing process.

4. The method for manufacturing a bevel gear member as defined in claim 1, wherein said bevel gear blank further has a shaft coaxially extending from said gearhead.

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5. The method for manufacturing the bevel gear member as defined in claim 4, wherein the step of providing said unitary bevel gear blank includes the steps of:

forming a bevel gear workpiece having said gearhead and said shaft;
forming said unitary bevel gear blank by machining said shaft of said workpiece using
a face angle surface of said gearhead of said workpiece as a locating surface for centering of
said workpiece.

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6. The method for manufacturing the bevel gear member as defined in claim 5,
wherein said bevel gear workpiece is formed by one of a forging and casing process.

7. The method for manufacturing the bevel gear member as defined in claim 1,
10 wherein said bevel gear member is a pinion gear member including a gearhead and a shaft
having first bearing seat portion and a second bearing seat portion, and wherein the step of
machining at least one selected surface of said unfinished bevel gear member includes the
steps of machining at least one of said first bearing seat portion and said second bearing seat
portion of said pinion gear member.

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8. The method for manufacturing the bevel gear member as defined in claim 1,
wherein said bevel gear member is a ring gear member having an inner peripheral surface and
a rear face surface, and wherein the step of machining at least one selected surface of said
unfinished bevel gear member includes the steps of machining at least one of said inner
20 peripheral surface and said rear face surface of said ring gear member.

9. The method for manufacturing the bevel gear member as defined in claim 1, further including the step of hardening said bevel gear member using a heat treating process subsequent to the step (b) of forming gear teeth and prior to the step of (c) of machining at least one selected surface of said unfinished bevel gear member.

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10. The method for manufacturing the bevel gear member as defined in claim 1, wherein the step (b) of forming gear teeth is a face hobbing process.

11. The method for manufacturing the bevel gear member as defined in claim 1,
10 wherein the step (b) of forming gear teeth uses gear cutter blades each including a shank and a cutting member having a cutting edge having a first section extending from a distal end of said shank at a given axial pressure angle and dimensioned to cut at least one of side profiles of said gear teeth of said bevel gear blank, and a second section substantially perpendicular to a central axis of said cutter blade and dimensioned to cut at least a substantial portion of a top
15 land of said gear teeth so that each of said gear cutter blades forms at least a substantial portion of said top land of said teeth of said bevel gear member simultaneously with said side profile thereof.

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